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THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

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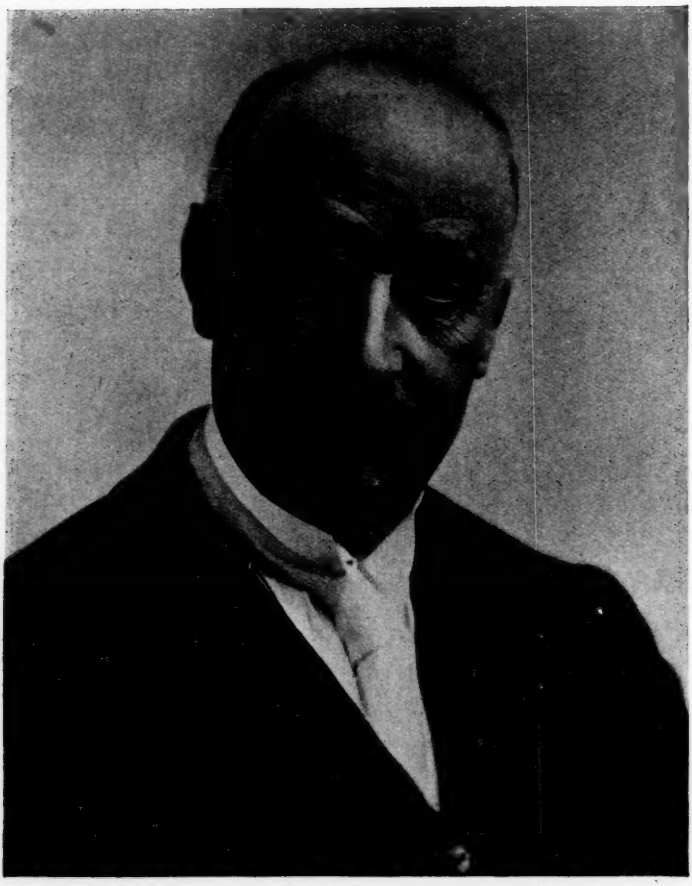

MR. SYDNEY H. SLOCOCK, F.R.C.V.S.

President of the Royal College of Veterinary Surgeons.

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OCTOBER, 1924.

Biography

MR. SYDNEY H. SLOCOCK, F.R.C.V.S.

BORN in 1860, educated at Christ's Hospital School, and then articled as a pupil in the veterinary profession for three years from the age of sixteen with Mr. Henry (afterwards Sir Henry) Simpson, of Windsor, and his brother, Mr. James Simpson, of Maidenhead, Mr. Sydney Slocock has had an opportunity for acquiring a knowledge of the tact and practice of his profession such as rarely falls to the lot of the student of the present day. That he has made good use of it is shown by the fact that at the present moment he stands forward as the ruling head of the affairs of the profession; and this, too, by the unanimous vote of his brother Members of Council.

Qualifying in 1882, he at once commenced practice on his own account at Hounslow, in Middlesex, and rapidly acquired a large *clientèle*; being shortly afterwards appointed as Inspector for the Ministry of Agriculture and the County of Middlesex. Taking his Fellowship in 1909, he was elected a Member of Council of the Royal College in that year, and held the office of Vice-President in 1911, 1914, and 1922. Although not often heard in the Council Chamber, his views, when spoken, have always been marked by common sense, and for the advancement of the profession.

Perhaps he is best known amongst the rank and file for his work in connection with the uplifting of those whom misfortune has overtaken, and his earnestness as President (an office to which he has been consistently re-elected for ten consecutive years) of the Victoria Benevolent Fund is evidence of his sympathy in this direction.

Fulfilling the dual office of the two Presidentships, it is up to the members of the profession to give him support equally through his year of office in each capacity, and we can rest quite assured that his sound judgment will steer us in the straight and right direction during the coming year.

Editorial

NATIONAL VETERINARY MEDICAL ASSOCIATION CONFERENCE AT ABERDEEN.

To use the word "success" in connection with the 1924 Conference of the National Veterinary Medical Association would, according to the accounts given by even the least enthusiastic of its members, be insufficient, for it is reported that the Scotsmen exceeded themselves in their unbounded hospitality to such an extent that they have been awarded their proverbial positions of "Heads of the Department" in the management of this affair; this position being so characteristic of their canny business capabilities when they come to "rob the Sassenach" down South. Nothing was misplaced, and everything went off without a hitch. The attendance of the members and their friends, although good (some 230 sat down to the Annual Dinner), leaves room for still greater improvement, as it is a poor proportion when one considers that there are over 3,300 members on the Register of the Royal College of Veterinary Surgeons.

The American Veterinary Medical Association which has just held its Annual Conference at Des Moines showed an attendance of over 1,000 members, and although we know that they have a bigger list to draw upon, their proportion of effectives and enthusiastic attenders at their annual gathering sets us an example which must keep us discontented until more are drawn into the fold.

The selection of Cambridge for our next year's gathering is a good one. It is central, and we anticipate that the chance of visiting such a well-known University centre, whose name has so recently been brought into prominence before the members of the veterinary profession by the establishment of the Chair of Animal Pathology and the appointment of a staff of veterinary research workers within its walls, will give an opportunity which will be eagerly grasped by every member who wishes for the scientific advancement of his profession. The older University must look to its laurels.

XUM

DOCTOR OF VETERINARY SCIENCE.

A NOTICE in our Review column (page 407) will be of especial interest to those members of our profession who consider that the title of "Doctor," if accorded to graduates in Veterinary Medicine, would be of material assistance in raising the status of the profession in Great Britain. In the column alluded to a brief review is made of an original thesis by which Professor Douville (whose name will be recollected as a very clever French Surgeon Specialist by many officers in the Veterinary Hospitals in France during the war), of the Lyons Veterinary School, earned his title of "Doctor in Veterinary Medicine."

The profession in France had this degree granted to them by the Universities of Paris, Lyons and Toulouse, some twelve months ago, in the face of, at first, considerable opposition.

It is obtainable at the close of the curriculum by the present-day graduate, and those already in practice who wish to acquire the title have to submit and defend a thesis before an Examining Board consisting of one Professor of the Faculty of Medicine and two Professors of the Veterinary Schools.

In Great Britain the only Doctorate at present obtainable is that of the University at which a graduate has previously obtained a degree of Bachelor of Science, or Bachelor of Veterinary Science.

For many years in Germany, Italy and America the title of "Doctor" is legally applied to the Veterinary Graduate, and in the Free State of Ireland it is a title of courtesy.

The subject has been mooted on more than one occasion in Great Britain, but has never been taken up seriously.

It rests with our Council and the rank and file of the profession to consider whether it would be of as much advantage to them here as it evidently is to their Continental *confrères*. At any rate, the younger B.Sc. graduates *must* follow up the good fortune and advantages which their youth, and the foresight and strenuous work of their predecessors of an older generation, have made possible for them. For them the D.Sc. degree must be kept in front as a prize to be not only aspired to, but attained.

XUM

General Articles

A PERSONAL EXPERIENCE WITH ANTHRAX.

By J. W. BATES, M.R.C.V.S.,
Sutton Weaver, Warrington.

On September 6, 1923, I was called in to calve a Jersey cow, but when I arrived the cow was dead. As the owner wished to know the cause of death, and seeing no discharge from the orifices, I proceeded to make a post-mortem examination. On exposing the spleen, my suspicions were aroused as to the question of anthrax infection, and examining a slide from the blood the bacilli were found to be present, which examination was confirmed by the Board of Agriculture.

On Saturday, September 15th, in the evening, I noticed a small pustule in the anterior surface of my left arm; two more developed in the posterior surface next day.

On Wednesday, the 19th, I called to see my friend, Mr. Collacott, the chief assistant at the Evans Sons Lescher and Webb Research Laboratories, Runcorn, who made micro and cultural examinations of the lymph fluid from the first pustule, which now appeared as a black centred ulcer about ¾ inch diameter. In the microscopical examination no organisms were seen, but débris giving the M'Fadyean reaction was noticed. A pure culture of *B. anthracis* was obtained after twelve hours' growth.

On the morning of the 20th, Mr. Collacott immediately acquainted Dr. Mitchell, the Medical Superintendent of the laboratory, of these facts, and I was requested by the doctor, through the telephone, to go to the laboratory for serum inoculation. I was injected with 40 c.c. of their anthrax serum, and advised to proceed immediately to the Fazakerley Hospital, Liverpool, where treatment was carried out quite successfully.

With regard to physical symptoms, up to the ninth day nothing whatever was noticed; on the ninth and tenth days the pustules, with their reddish halo, appeared, but caused only very slight irritation up to the thirteenth day, by which time they had increased in size and become black centred ulcers with black crusts. The arm was now much swollen and inflamed from wrist to shoulder, and the axillary gland had swollen to the size of a pigeon's egg and was, with the arm, causing much pain, accompanied with headaches and general malaise.

VERMINOUS BRONCHO-PNEUMONIA IN THE PIG DUE TO *METASTRONGYLUS APRI*; WITH OBSERVATIONS ON THE CHLOROFORM METHOD OF TREATMENT.

By NORMAN BISSET, M.R.C.V.S., F.Z.S.(Scot.),

Adviser in Veterinary Science, University College of South Wales, Cardiff.

In February, and again in the summer months of last year, the opinion of the writer was asked on respiratory affections of obscure origin in pigs. The outbreaks occurred in each case in high-lying localities about seven or eight miles apart, the pigs, however, being obtained from different sources.

Case 1.—This outbreak occurred on premises belonging to a business man whose hobby was the experimental feeding of pigs. The history of the case, before the writer was called in, is as follows :—

Six pigs were purchased from a litter of eight which were farrowed on rather low-lying marshy ground. When purchased, a slight intermittent cough was noticed, but was thought to be of no consequence. This cough, however, became more pronounced, and the animals, after doing well for a few weeks, ceased to make any progress, although they continued to eat well. About a fortnight after the pigs had ceased to put on weight, two died suddenly, and post-mortem examinations were held on each of them. Bronchitis was the only pathological appearance noted. The lungs were especially mentioned to the writer as being healthy in appearance, as pneumonia was suspected. The remaining four pigs continued to cough, the latter gradually becoming worse. Appetite, however, was maintained, although the animals began slightly to lose flesh. The case of the two deaths was reported as suspected swine fever, although there were no signs of that disease, and the suspicion was later negatived. The writer was then communicated with, and visited the premises. The pigs at this time were between two and three months old. They were housed in a shed with a corrugated iron roof. The front of the shed had been open, but had been boarded up since the death of the aforementioned animals.

The pigs were coughing very badly, arching the back, and straining at each paroxysm. The cough was of the "husky" type, and was particularly noticeable when the animals were moved or excited. When they were caught and attempted to squeal, a faint wheeze was the only result. During quiet periods the cough was noticed only at intervals. All the animals showed a thick yellowish nasal discharge. The general condition was only fair, but none of the pigs were actually emaciated. The worst case was a gilt, which showed prolapse of the rectum as the result of straining. This animal

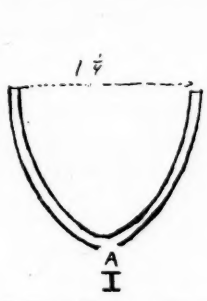
was killed and examined, being brought back to the laboratory for the purpose. The trachea, bronchi, and larger bronchioles contained a considerable quantity of mucus mixed with particles of food, the latter aspirated during the spasms of coughing. Bronchitis was evident. On examining the mucus microscopically, numerous oval worm eggs, measuring on an average 70 × 45 microns, and each containing an active embryo, were found. No free embryos were observed. The lungs certainly did not appear typically pneumonic. They showed no mottling, but small elevations were seen on the surface, and on palpation numerous small hard nodules about the size of a pea could be felt, particularly round the periphery, decreasing in number towards the body of the lungs. On incising one of these nodules it was found to consist of a mass of worms occupying and distending the bronchiole. The worms, varying in length from 1½ to 2 inches, were found to be female *Metastrongylus apri*. The lungs were then carefully dissected, and it was found that by far the greater number of the parasites was present in the peripheral region of the organs, corresponding to the location of the nodules, though the worms were also present in parts of the lungs where no nodular formation was evident. In the larger bronchioles towards the centres of the lungs, one or two worms per bronchiole were found, but towards the periphery the bronchioles were packed with six or more, causing the distention and apparent nodular formation. The worms were surrounded with the tenacious yellow mucus which was in some parts streaked with blood, and also filled the bronchioles in which no worms were found. The total number of parasites found in both lungs was 210, and of these only twenty were males. It is worthy of note that in spite of a thorough examination of the mucus in the trachea and ramifications of the bronchi, not one liberated embryo could be found, though eggs were numerous. The latter were found, however, only in the bronchi and their larger branches.

Some of the parasites were quite active. At first, in clearing one bronchiole, the writer laid each worm on the inside of an opened bronchus until the next could be dislodged, but soon had to abandon this owing to the rapidity with which the parasites disappeared down the openings of the various branches of the bronchus.

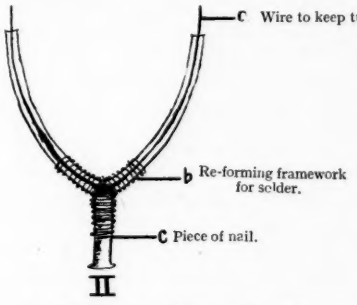
On attempting to wash the worms in water they almost immediately (within about one minute) disintegrated, so warm physiological saline was substituted, in which they appeared quite lively and remained so for three days when kept in the incubator at 37° C.

Treatment.—Owing to the deep-seated location of the parasites, it was resolved to attempt treatment by means of the intra-nasal injection of chloroform. First, however, fresh clean quarters were

prepared and the old premises were disinfected and whitewashed. A week later, when these preparations were completed and the animals had been starved for twelve hours, another visit was paid. The three remaining pigs were coughing very badly even while at rest. They were reported to be still feeding well, but had noticeably lost condition. Each pig received 2 c.c. pure chloroform, 1 c.c. being

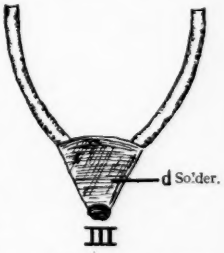


I. Bent Tubing: Outer Wall Sawn Through at A.



II. Detail of Double Nozzle.

dropped into each nostril with a hypodermic syringe minus the needle. After the administration, the animals staggered about for a minute or so, but soon recovered. As each was treated it was put in the new quarters. Treatment was repeated four days later, when it was noticed that the coughing had markedly diminished, which observation was confirmed—with emphasis—by the pigman. The squealing was, however, still very hoarse. One pig appeared to be suffering from some affection of the urinary organs, as it was persistently arching the back and straining, having apparently considerable difficulty in micturition. In this case also the cough was much less evident. Four days later, when another visit was paid, the cough had practically disappeared, and a slight improvement in condition was noticed. Treatment was repeated, and there was no doubt whatever regarding improvement in squealing powers. Four days later the cough had quite disappeared, but it was decided to kill the pig which was showing signs of urinary trouble. On examination of the viscera, a cystic growth was found on the neck of the bladder. The lungs were perfectly normal, and no trace whatever of worms was found in the whole respiratory tract.



III. Double Nozzle Complete.

It is interesting to note that the farmer from whom the pigs were bought stated that the two he retained from the litter showed no cough and "made splendid pigs." None of the other pigs on that particular farm suffered from the parasites.

CASE 2.—The second outbreak occurred in a herd of eighty-nine young pigs of about two months old. The history in this case was as follows :—

None of the pigs came from the same locality as in the last case, and none were coughing when purchased. All seemed to commence to cough about a week afterwards. Two died suddenly and were examined, distinct broncho-pneumonia being found in each case. The writer was called in the day after the last post-mortem examination, and the cut lungs had been put aside overnight in a bucket of water for his inspection. From the husky nature of the cough, which was markedly increased on exercise, the nasal discharge, and general appearance of the animals, verminous pneumonia was suspected. A thorough examination of the lungs revealed the anterior half of a worm only, but on carefully examining the blood-stained water in the bucket, numerous disintegrated worms were discovered. The premises were then examined. The pigs spent most of their time in the open air, having the run of a large field—shelter consisting of disused cowsheds provided with a cement floored run in front. Through the field there ran a shallow stream, which was actually the overflow from a spring farther up the slope. The stream simply lost itself in the centre of the field, the water spreading out on either side and making the ground marshy. Although the owner had never previously experienced this trouble among his pigs, which had always had the use of the field, he was advised to keep the present animals out of it, or at least to fence off the marshy part.

To make diagnosis more certain the worst case in the herd was killed and examined. The lungs in this case were both pneumonic at the periphery, while there were pleuritic adhesions in the case of the left lung. Otherwise the examination produced exactly similar results as in Case 1, except that four female worms were found in the trachea itself. As the work of dislodging the parasites from the bronchioles by hand was very tedious and time could ill be spared, the following method was adopted : The lungs were incised in several parts and placed in warm physiological saline in the incubator at 37° C. overnight. Next morning nearly all the worms had left the lungs and the majority were alive in the fluid. Only twelve were found in the lungs themselves, while 241 were removed from the saline. As in the former case, these lived for three days in saline at 37° C. In this case fourteen males only were found, while

again no free embryos could be discovered in spite of careful examination.

The chloroform method of treatment was again adopted, though with some misgiving, as the weather this time (July) was at its hottest. The same dose, viz. 1 c.c. per nostril, was again given. This made the animals stagger and occasionally fall, but they soon recovered and there were no casualties. Treatment was repeated twice again at four days intervals. A slight improvement was noticed after one treatment only, while a week after the third treatment the cough was practically gone. The first sign of improvement was shown in the " squeal," which at first was only a husky wheeze, but at the third treatment one became almost as hoarse as the pigs had been, through endeavours to make oneself heard above the noise. It was found in administering the chloroform that much time and material were wasted through the pigs refusing to allow the drug to be injected into the second nostril, so a double nozzle was made to the syringe, the " prongs " being about $1\frac{1}{4}$ inches apart. This was found to answer admirably and was used for the second and third treatments, much time and chloroform being saved by its use.

Two weeks after the third treatment the coughing had quite disappeared. The animals were kept out of the marshy field, and the houses and run had been thoroughly disinfected. About a month later, however, the writer was informed that the coughing had recommenced, and it was found that the pigs had been completely free from coughs for nearly three weeks, when they had been again allowed access to the suspected field. Within a week the coughing again began.

The treatment was twice repeated and the field again forbidden. Considerable improvement was noticed after two treatments only. Another treatment was contemplated, but in the meantime the owner was able to sell the animals. No pigs died from respiratory affections from the time the treatment was commenced, though a few died from intussusception of the gut and stoppage of the bowels. One only died from choking while struggling during administration of the chloroform.

During the whole outbreak the animals showed a good appetite, except those which developed digestive troubles.

It would appear from the foregoing cases that :—

1. The time of year is of little importance in connection with outbreaks of infestation with *Metastrongylus apri*—the first case occurring in February, the second in July, with a recurrence in August.
2. Marshy ground is the most likely source of infection.

3. The parasites are situated in greatest numbers in the periphery of the lungs.
4. Females greatly predominate numerically over males.
5. Eggs do not appear to hatch in the respiratory tract.
6. Adult parasites are destroyed by immersion in water, but will emerge from the lungs and live for three days if these organs are placed in physiological saline at 37° C.
7. Chloroform administered intra-nasally in doses of 2 c.c. per pig—1 c.c. per nostril—by means of a double-nozzled hypodermic syringe appears to be effective.
8. Three treatments at four-day intervals are preferable.

The double nozzle for the hypodermic syringe was made by T. Gubb, my laboratory attendant, as follows :—

A piece of thin tubing about 2½ inches long was bent round until the two ends were 1¼ inches apart. A piece of the outer wall of the tube (about ⅛ inch long) at the middle of the arc was sawn off. A nail slightly greater in diameter than the actual nozzle of the syringe was inserted in the hole thus made in the tube. Thin wire was then wound round the tube on each side of the hole and also round the nail. A piece of wire was also passed completely through the tube in order to keep it open. Solder was then applied over the twisted wire. When this had set, it was filed into shape and the nail and piece of wire in the tube were withdrawn. The hole left by the nail being slightly larger in diameter than the actual nozzle of the syringe enabled the double nozzle to be pushed over the latter.

A NOTE ON THE VALUE OF HÆMOPLASTIN (P. D. & Co.),

By H. R. HEWETSON, M.R.C.V.S.,
Southport.

THE subject was a Sealyham dog, five years old, which had been run over by a motor-car. On my seeing him (8 a.m.) about three-quarters of an hour after the accident I found him in a state of extreme collapse, membranes of eyes and mouth practically white, eyes glassy and the whole body blanched and cold but the heart just beating. A serious internal hæmorrhage was evident and I gave a grave prognosis. I injected hypodermically 2 c.c. of Hæmoplastin (P. D. & Co.) and 3 grains of Camphor in Oil. He was wrapped up in blankets with hot water bottles and placed at the open window. Two hours later when I visited him I found him—to my surprise—still alive and showing slight signs of improvement. I injected a further 3 grains of Camphor in Oil, and by evening he was sufficiently strong to lap a little milk. He continued to improve, and in a fortnight was running about as usual, there having been no indication of any further hæmorrhage.

EHRLICH'S ALDEHYDE TEST FOR UROBILINOGEN.

By W. E. ARMSTRONG, B.V.Sc., M.R.C.V.S., D.V.H.,
Wigton, Cumberland.

In the April number of the *Proceedings of the Royal Society of Medicine* mention is made by Berkeley, Dodd and Walker of the above test for the detection of urobilinogen in human urine, and the simplicity of the test commended itself to me, so I applied it to thirteen samples of animal urine, with six positive and seven negative results.

The positive results were :

Four cases of bacillary necrosis of the liver, verified P.M.

One case of undetermined liver trouble.

One lamb with (?) diabetes, of which I intend to write at some future date, when its death occurs.

The negative results were :

Four samples from normal cows.

Three samples from cases of milk fever.

The urine from the three milk fever cases was used to test the reliability of the test, as one might expect a slight reaction where there is little bowel movement.

OBSERVATIONS ON THE MORPHOLOGY AND LIFE-CYCLE OF *FILARIA RECONDITA* GRASSI.*

By M. ANANT NARAYAN RAO.,
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It is over half a century since microfilariæ were demonstrated in the general circulation of man, animals, and birds, and this has given rise to a good deal of discussion as to the species of nematodes which are the mature forms of the microfilariæ. A few of the mature worms have been discovered and their life-history worked out, but the life-history of many others has not been published.

A dog harbouring microfilariæ in its general circulation came under the notice of the writer during the last week of December 1921, but unfortunately the dog died soon after and the chance of studying these parasites was lost. This was the first time that the writer found microfilariæ in the blood of a dog in the hospital of the Madras Veterinary College. In the month of January 1922 another case of "filariasis" was found, and every opportunity was taken for making observations. The history of these two cases showed that the first

* We are indebted to the Agricultural Research Institute, Pusa, for permission to publish this article.

dog was brought to Madras from Baluchistan and the second one from the Punjab.

Source of Material.—Observations were made on the few cases harbouring microfilariæ among the in-patients in the dog-ward of the Madras Veterinary College Hospital. From December 1921 till June 1922 seven cases were detected out of 299 dogs admitted as in-patients during that period. The microfilariæ from these seven different cases all appeared to be the same. The parasite was not found in even one dog out of 555 treated as out-patients during the same period. The writer has had neither the time nor facility to find out what percentage of street dogs in Madras harbour these parasites. Lewis says that he found as many as one in three in Calcutta, but it is not known if this has been confirmed.

Description of the Microfilariæ.

In a drop of fresh blood, the microfilariæ are snake-like organisms, long and fine, almost transparent, but when viewed with a high-power lens a granular structure enclosed in a thin transparent cuticle is visible. This is best seen when the movements of the embryo are slow. They wriggle about, twist and untwist, and lash the blood cells near them with their posterior ends. They often coil and uncoil like an earthworm attacked by ants. Another noticeable feature about the parasites is that they make long excursions in the drop of blood on the slide, but as often they catch hold of the cover glass by their anterior extremities and remain fixed for a long time while their bodies wriggle about in every direction. This characteristic feature agrees with the description of *Filaria recondita* or *Hæmatozoon lewisi*, given by Neumann on page 535 in his book on *Parasites* (2nd edition). They frequently shoot out a minute spine from the cephalic extremity and as quickly withdraw it once in every two or three seconds. This movement is analogous to the shooting out and retracting of the tongue of a snake. In a hanging drop of blood, in about four hours after making it, the movements of the microfilariæ slow down, and at the end of twenty-four hours they are all more or less stretched out and apparently dead. Even at this stage they can be stained well with aniline dyes. These microfilariæ are not enclosed in a sheath. The anterior end is almost the same or a trifle smaller in diameter than that of the body. The cephalic extremity is rounded and does not contain any granules. The spine which often shoots out from the anterior extremity of the parasite is an interesting object. It is suggested that it probably plays an important part in bombarding and boring through the tissues. The ability of the worm to catch hold of a surface by its cephalic extremity

further renders it easy to concentrate the bombardment at a particular point. The shooting out of this spine is only observed in fresh blood in hanging drops. It is never seen in the microfilariæ that have gained entrance to the thorax of a mosquito. In a stained specimen the granules in the body of the parasite are very well seen, and also three breaks in their continuity are brought out clearly. These granules are larger and more closely packed than those found in *Microfilaria Bancrofti*. They appear to be arranged spirally and not strewn haphazardly. The breaks in the granules, excepting the first one—the so-called nerve ring—are not visible from every point of view. In the fresh state, the transverse striation of the cuticle is not well seen, but in many of the stained specimens it is brought out very clearly. (Figs. 1 and 2.) Manson says that it is " probably produced by the longitudinal contraction of the body of the parasite throwing a very delicate and but slightly elastic cuticle into folds like the bellows of an accordian." My observations agree with this, and it seems to explain why one finds so much difference in the measurements of the microfilariæ, those showing folds always measuring less than those without them. Thinking that fixation with alcohol caused contraction, I allowed the slides to dry in the air, then hæmolysed the smear with distilled water and measured the microfilariæ while it was still wet. There was still the same difference, however. One can very well compare the contractile movements of these parasites with those of the trunk of an elephant when it shortens its trunk. The so-called genital cells are visible in the fresh specimen, but are not well marked in a stained one. Fülleborn's vital staining method was adopted for live embryos, and the stain was seen to diffuse within the parasite through the " V " spot. This seems to confirm the idea that the " V " spot forms part of a rudimentary excretory or water vascular system. The posterior end gradually tapers to a fine point. The granules extend almost to the end of the tail.

Measurements.—The length of the microfilariæ in fixed and stained films ranges from 221 to 225 microns, and the breadth from $4\frac{1}{2}$ to 5 μ. In a dry and unfixed film the length ranges from 230 to 256 μ, but the breadth remains the same as in the stained films. The parasites can, with some difficulty, be measured when they are alive, but the measurements can only be approximate. The live specimens are found to vary from 230 to 270 μ in length and from $4\frac{1}{2}$ to $5\frac{1}{2}$ μ in breadth. Neumann, quoting other workers, says that the length of *H. lewisi* is 280 μ and breadth 5 μ.

Viability.—In a hanging drop preparation taken with precaution to ensure sterility, and kept at room temperature, the microfilariæ

which were very active at first were found at the end of twenty-four hours apparently dead, only a couple of them were seen to move a little twelve hours later. A few hanging drop preparations were kept in the incubator at 37° C., and a few in a tin box in ice. In those kept in the incubator all the microfilariæ were dead at the end of sixteen hours, but those in the other drops kept on ice were active, but lived only forty-eight hours. According to Gruby and Delafond, *H. lewisi* could still live and be vivacious after ten days in blood kept at 15° C. (Neumann's *Parasites*, p. 536, 2nd edition).

Enumeration of Microfilariæ in the Various Organs of the Body.

The largest number of microfilariæ were seen in the blood squeezed out of the lungs, the liver stands second, the kidneys stand third, and the glands and spleen come last. The arteries and veins of the brain contained almost the same number as found in the drop of blood from the kidneys. The urine of every case harbouring these parasites was centrifuged and examined, always with negative results. Manson says that in the human being the largest number of microfilariæ were found in the sections of lungs, but in the dog the largest number were found in the sections of the liver. (Fig. 4.) In these sections they were found in the capillary spaces. Taking into consideration the habit of these microfilariæ in clinging to a cover glass in a hanging drop of blood there seems to be every likelihood of the capillaries being blocked by them, especially if a few of them become entangled to form a plug. Rivolta is therefore right, perhaps, in stating that these parasites do block up capillaries, but Neumann says that it is improbable that the embryos exercise an embolic action because of their small size.

Post-mortem Examination and Morbid Anatomy.

Three post-mortem examinations were made on dogs which had harboured this parasite, and the changes observed were similar in each of them. All the internal organs were anæmic. There was a certain amount of dilatation of both sides of the heart. The liver was enlarged and showed on the surface whitish areas varying from the size of a mustard seed to the size of a walnut. On section similar areas were also found in the interior of the liver as well. The picture of the liver was exactly like the one illustrating "Infraction of the liver" given in the *Textbook of Pathology*, by Delafield and Prudden. Microscopical examination of sections showed large areas of caseation surrounded by a zone of congestion. The caseated

portions were also surrounded by a well-marked zone composed of fibro-blastic tissue. In the other portions of the liver the central veins were dilated showing chronic venous congestion. Pigment granules in the cells were also seen here and there.

The spleen was considerably enlarged, the kidneys were pale and larger than normal. The microscopical examination of a section of the kidney showed degeneration involving the parenchymatous tissue. The interstitial substance showed proliferation though not to a marked extent. Leucocytic infiltration was also seen in the interstitial tissue. The sublumbar lymphatic glands were much enlarged —each was almost the size of a small orange. On section the glands were pink in colour and showed a few hæmorrhages.

Microscopical examination of sections showed hyperplasia and in some places caseation. The large bloodvessels of the body did not show much change excepting a slight increase of thickness in the fibrous coat.

Intermediary Host.—With due respect to the work of eminent scientists like Grassi, I venture to suggest that the development of *Hæmatozoon lewisi* of the dog takes place in the mosquito *Culex fatigans*. Near the kennels, where one of these dogs harbouring *H. lewisi* was kept, a few mosquitos—*Culex* and *Stegomyia*—were caught and dissected. Over 30 per cent. of the *Culex* mosquitos contained microfilariæ in their midgut, but very few of the *Stegomyia* showed them, and then only in very small numbers. The number in the *Culex* mosquitos ranged from one to fifty-five in each. No time was lost in breeding these two varieties of mosquitos and experimenting with them in an attempt to settle the question as to whether the microfilariæ they contained were from man, other animals, or birds. A large number of each of these home-bred mosquitos were made to bite a dog harbouring these parasites, and then the mosquitos were kept alive by feeding them on plantain juice, which they seem to like very much and thrive on. A few of these mosquitos were dissected daily for nearly three weeks. By the end of that time the *Stegomyia* did not show developmental forms and were discarded.

Three hours after biting the dog a couple of *Culex* mosquitos were dissected and their midgut was crushed in normal saline solution on a slide and observed under a microscope. The embryos they contained resembled those seen in the peripheral blood of the dog (Fig. 8), but they were sluggish in movement and seemed to have given up the habit of catching hold of the cover-glass with their cephalic extremities. This is probably because they were surrounded by thickened blood. A few of these shot out spines and retracted

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them as quickly as they do in dog's blood. Eight hours after feeding, the microfilariæ in the mosquitos' midgut looked stouter though not longer than the ones found in the circulation. (Fig. 7.) The cutaneous covering of the body looked thickened, and when the embryo bent on itself the inner curve folded up with a dent analogous to the one found in a partly inflated inner tube of a bicycle when folded on itself, and when the parasite straightened the dent jerked out straight. After thirty-six to forty hours all of them had disappeared from the midgut and had migrated into the thoracic muscles of the mosquitos. There they lay between and parallel to the muscle fibres. Seven to nine days after biting the dog, the thoracic muscles of the mosquito contained short thick "larval" forms with a short prolongation at one end. Occasionally this prolongation or "tail" of the larva moved to and fro rapidly. The movements of the larva itself were very slow. It bent on itself and straightened in moving forwards. The cells in its interior were arranged in two rows. I found only 9 per cent. of the mosquitos experimented with showing the developmental forms in their muscles. (Figs. 9, 10 and 11.)

Measurement (in Micron) of Microfilariæ in the Gut of Mosquito Eight Hours after Feeding.

	I	II	III	IV	V
Head end to nerve ring ..	40	38	42	40	40
Nerve ring to "V" spot ..	32	34	34	32	30
"V" spot to tail spot	100	96	96	102	100
Tail spot to end of tail	80	84	82	80	84
Total length	252	252	254	254	254

The breadth varied from $5\frac{1}{2}$ μ to $6\frac{1}{2}$ μ.

On the fifteenth day in the mouth of one mosquito, out of the six dissected, two long larvæ, each with a rudimentary alimentary canal extremity, were found. Each resembled very closely the illustration shown in the book on *Tropical Diseases*, by Sir Patrick Manson, in connection with human filariasis. They were about half a millimeter in length. These forms were unfortunately lost while trying to stain them. Sections of a large number of other mosquitos which had been fed on an infected dog were also cut and examined after staining them. The larvæ in sections or in saline solution were difficult objects for photography, because it was not very easy to focus the whole larva in thick sections, nor was it easy to focus an almost transparent object in saline solution with the improvised apparatus

I had for the work. Many workers have pointed out that the developed larvæ migrate towards the head of the mosquito, and after reaching it remain coiled up inside the root of the proboscis, under the cephalic glands, or they may even find their way into the labium. Labredo's method of subjecting the head of a live mosquito to pressure in normal saline solution was followed, and it was observed that the larvæ being dealt with escaped from the labium and also from near the root of the proboscis. In the accompanying photograph of the head of a mosquito I saw two larvæ escaping from a breach in the labium, one of which escaped altogether and the other remained as seen in the photograph. This mosquito had been fed on an infected dog seventeen days previously (Fig. 12).

Concluding Remarks.

The blood of many dogs brought to the College Hospital for treatment had been examined for various diseases prior to December 1921, but no cases of filariasis were detected until then. Except the first two cases, the others occurred in dogs that were brought to the hospital for other reasons and kept in contact with the first two cases for periods varying from a fortnight to a month. It seems feasible, therefore, to suppose that these five cases acquired the parasite after their admission into the hospital, and my observations lead me to believe that they did this through the agency of *Culex* mosquitos.

Grassi and Calendruccio say that they found the embryos of *H. lewisi* in the dog flea, cat flea, *Pulex irritans*, and even in the tick *R. sanguineus*. This, I believe, has not been confirmed by other workers. I have dissected and sectioned many dog fleas collected from the infected dogs, but I did not find anything resembling the development forms of *H. lewisi* in them. It is possible, of course, for many blood-sucking parasites to ingest these microfilariæ, but they may not develop in all of them.

I take this opportunity of thanking Mr. J. G. Cattell, M.R.C.V.S., D.V.S.M., who was then in charge of the College Laboratory, for so very kindly giving me valuable hints and encouragement.

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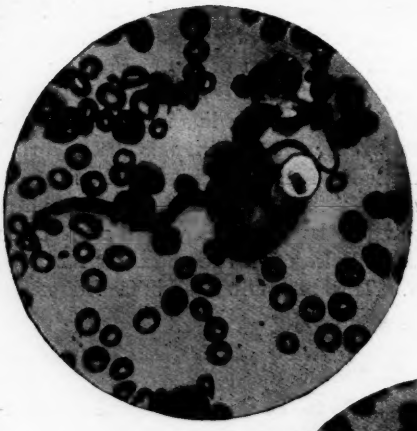

FIG. 1.—*Filaria recondita* Grassi in the peripheral circulation. Note the spiral arrangement of the granules clearly seen at the head. Note the striation at the tail. × 850.

FIG. 2.—*Filaria recondita*. Note the striation at the tail, nerve ring, and tail spot. × 850.

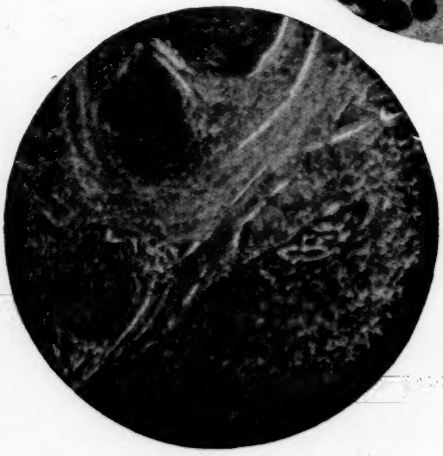

FIG. 3.—Section of the liver showing necrosis, caseation, and degeneration of liver cells.

FIG. 4.—Section of the liver showing a microfilaria in the capillary space. A portion of the parasite is seen. Note the granular changes in the protoplasm of the liver cells. × 650.

FIG. 5.—Section of the kidney showing degeneration of the glomeruli, catarrhal changes in the tubules, and cell infiltration in the fibrous tissue

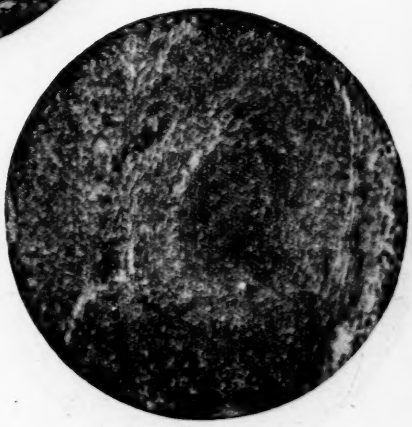

FIG. 6.—Section of the lymphatic gland showing caseation and proliferation of fibrous tissue

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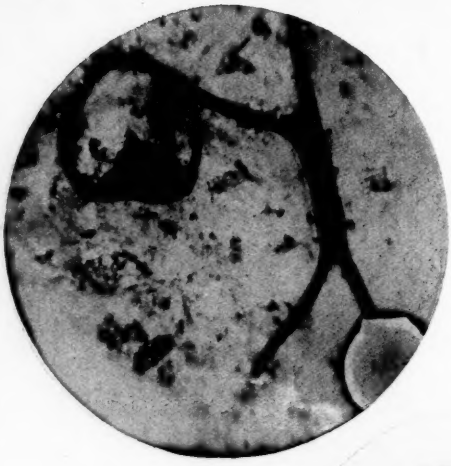

FIG. 7.—Microfilaria from the gut of a mosquito eight hours after feeding. × 850.

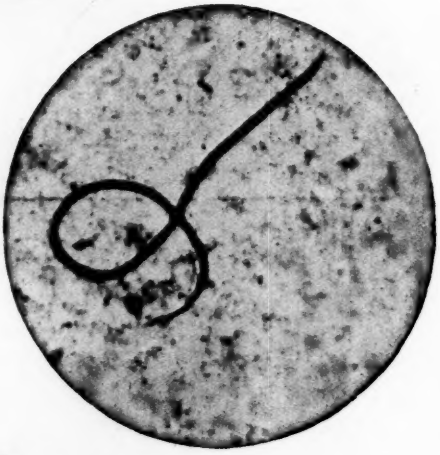

FIG. 8.—Microfilaria from the gut of a mosquito three hours after feeding. The parasite shows striation at the tail end, though not well marked in the photograph. × 550.

FIG. 9.—Larva from a teased thoracic muscle of the mosquito in normal saline solution.

FIG. 10.—Larvæ in the section of the thoracic muscle of a mosquito seven days after feeding. × 850.

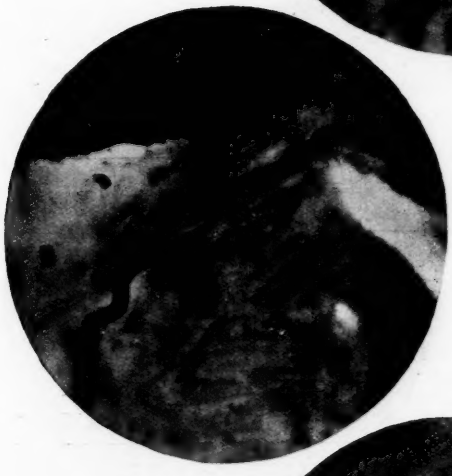

FIG. 11.—Larva in the thoracic muscles of a mosquito twelve days after feeding. × 850

FIG. 12.—Head and proboscis of a *Culex* mosquito showing larvæ of *F. recondita*; one has almost come out of the labium and another from near the base of the proboscis. The latter is damaged a little. The mosquito was fed on an infected dog seventeen days previously. × 850.

Clinical Articles

OBSERVATIONS ON THE FEEDING OF HORSES ON *LATHYRUS SATIVUS*.

By Lieut.-Colonel W. H. WALKER, D.S.O., O.B.E.,
Director of Veterinary Services, India.

The question of the poisonous properties often ascribed to *Lathyrus sativus* (a small and somewhat three-cornered mottled pea) by older writers has recently been under investigation, not with a view to utilising the grain as animal food, but to arrive at some practical decision as to whether or not a small percentage as an adulterant to gram might with safety be allowed in animal rations.

To arrive at some idea of the percentage of *Lathyrus sativus* contained normally in gram as purchased and supplied to the Army, samples were obtained from stations covering practically the whole of India; these were carefully hand-packed, and the following adulterations recorded :—

Station.	Percentage *Lathyrus sativus*.	Station.	Percentage *Lathyrus sativus*.
Risalpur	0·05	Secunderabad ..	—
Rawalpindi	—	Mhow	0·11
Jubbulpore	0·05	Ambala	—
Jhansi	0·04	Kirkee	0·06
Nowshera	0·11	Allahabad	3·87
Bangalore	0·22	Lucknow	3·37
Delhi	—	Muzaffarpore ..	0·05
Meerut	0·41	Quetta	—
Lahore	0·8	Karachi	—

Records available contain no mention of ill-effects of feeding gram thus adulterated to animals.

Following on this, feeding experiments were carried out at the Station Veterinary Hospital, Lucknow, and as it has been suggested that the poisonous properties attributed to *Lathyrus sativus* may be due to contamination by other small seeds not identified, the *Lathyrus sativus* was cleansed of all other grain before feeding—from 16 maunds (1,280 lb.) of *Lathyrus sativus*, 30 lb. of other grains were extracted.

Seven horses were selected for the experiment which was continued over a period of 35 days.

Two horses received 10 lb. *Lathyrus sativus* per diem with chaff and hay.

Two horses received 5 lb. *Lathyrus sativus* per diem with 5 lb. bran also chaff and hay.

Two horses received 2 lb. *Lathyrus sativus*, 4 lb. bran, 4 lb. barley, chaff and hay.

One horse received gradually increasing quantities of the seeds removed from the Mutter pea by screening, starting with 2 oz. four times a day up to 6 oz. four times a day, in addition to the ordinary hospital diet.

It was found that the animals had considerable difficulty in masticating the grain (*Lathyrus sativus*), therefore from the third day onwards it was given crushed.

All the animals were either ridden or lunged twice a day.

Temperature, pulse, and respiration of all animals remained normal throughout the time they were under observation.

The only abnormality noticed was one horse which showed incoordination of movement on the seventeenth day, which was more marked on the following day; afterwards the animal improved and became normal, although no alteration was made in diet, and the incident was probably not attributable to *Lathyrus sativus*.

As a final experiment all animals in hospital received 1 lb. of *Lathyrus sativus* per diem for four days. Nothing abnormal was noted.

These observations are of interest. The evidence of older observers that lathyrism (paralysis) in animals does at times result from feeding *Lathyrus sativus* cannot be dismissed.

It may be that the grain is only poisonous :—

(i) Under certain conditions of growth.

(ii) Intermittently, as in the case of linseed and mustard, as recorded by Major-General Sir John Moore, K.C.M.G., C.B., F.R.C.V.S.; H. Tudor Hughes, B.Sc., F.R.C.V.S.,; and G. T. Dunne, F.R.C.V.S., in the VETERINARY JOURNAL of January 1924. The poison in such cases being due to a glucoside formed under certain conditions, e.g. fermentation.

This view appears to be the most likely one, and is supported by the fact that the poisonous effects in all these cases are reported to be destroyed if the grain is boiled; but this, however, was not confirmed in further experiments on three horses receiving daily 2 lb. of *Lathyrus sativus* for a period of two months after it had been soaked for twelve hours and fermented.

The results of the experiments lead one to conclude that the adulteration of gram as normally supplied to the Army in India can be ignored as far as it is likely to produce any ill-effects on animals.

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THE RATIONAL TREATMENT OF ACUTE ABDOMINAL PAIN IN THE HORSE.

By Lieut.-Colonel RAINEY, C.B.E., M.R.C.V.S.,
London.

The writer has nothing new to suggest in the curative treatment of the several diseases of the horse whose chief symptom in the early stages is acute abdominal pain; his object in offering the following remarks is to criticise briefly, and, he hopes, reasonably, some of the existing methods of treatment with a view to reconciling divergent ideas and preventing unnecessary suffering of animals.

If any of the following statements appear to be dogmatic, it is because style has been sacrificed to brevity, and not because of any claim to infallibility.

The common causes of acute abdominal pain are, of course:—

1. Simple spasmodic colic.
2. Flatulent colic, whether of stomach or bowel.
3. Strangulation.

The rarer causes are left out of consideration here.

Simple colic is never fatal, and it has not been proved that the administration of drugs affects its course. It may indeed be seriously questioned whether adequate absorption of drugs given by the mouth can take place from the mucous membrane during the acute phase of colic. Observations and common sense demonstrate that the rough handling of forced exercise and drenching increases the discomfort, and that the injection of powerful peristaltic excitants such as arecoline and physostigmine intensifies the agony of the spasms.

Lavage by the stomach tube in simple colic is scientifically correct, because thus one prevents with certainty rupture of the stomach; and the operation may give relief from causes that are not definitely known. If the case proves to be one of strangulation, then at least nothing has been done to intensify the pain.

Those who inject arecoline or physostigmine as a routine measure in cases of abdominal pain admit that the agony of simple colic is temporarily increased, but claim that the course of the affection is shortened. The writer has failed to satisfy himself of the truth of this claim, but has obtained much evidence of the fact that the lapse of time alone will enable the practitioner to differentiate simple colic in many cases from strangulation, and that in the latter affection the employment of these peristaltic excitants is useless and inhumane.

The administration of a narcotic subcutaneously facilitates the operation of passing the stomach tube, does not prolong the course

of the affection, and may deaden the pain ; consequently the practice seems to be justified on rational and humane grounds.

In flatulent colic of the large bowel, abdominal puncture becomes a matter for discretion ; in extreme cases at least it relieves pain.

The administration of enemata on a small medicated scale, or on a large unmedicated scale by means of a hose-pipe, seems to be indicated on scientific grounds, but the results in practice are disappointing ; the writer, at any rate, has obtained no positive evidence of the efficacy of this means of treatment.

In conclusion, therefore, so far as an ordinary practitioner may reasonably judge, the means which may properly be taken in the routine treatment of acute abdominal pain in the horse, as commonly met with, are restricted to the injection of narcotics and stomach lavage, followed, at discretion, by the administration of saline solution or aloes. Scientific evidence cannot, it is thought, be produced to show that the results obtained by these means will compare unfavourably with those obtained by other means, whereas, by avoiding the use of powerful peristaltic excitants, much pain will be spared to animals.

A DISTINCT ABNORMALITY IN THE SEMEN OF A STALLION ON MICROSCOPIC EXAMINATION.

By Major H. ALLEN, R.A.V.C.,
Remount Depot, Saharanpur, India, U.P.

Subject.—T.B.E. Stallion. Foaled 1910.

History.—Had been loose with a number of selected mares and reported on as not "filling" his mares and passing blood during the complex reflex act of ejaculation of semen.

He had had orchitis previous to my inspection to a slight degree.

His condition was poor, and he appeared physically weak during progression.

He covered a mare in my presence in a vigorous manner, but did not ejaculate semen at the first jump.

The semen eventually collected appeared microscopically normal in colour and consistency, and as usual rapidly liquefied. The fluid ejaculated in the first instance was evidently from the urethral and Cowper's glands, the true seminal fluid being emitted in dilution with prostatic secretion and mixed with material from the vesiculæ seminales during the second covering.

Microscopic examination of stained smears of the semen revealed the following :

The semen appeared to be a rich culture of a minute pleo-morphic bacillus, found distributed through the albuminous fluid and also in

very large numbers in the few shed epithelial cells. No " pus " cells were clearly demonstratable.

Many large gram-fast bacilli were present, which from their situation and morphology were regarded as common extraneous contaminants. Few spermatozoa were seen, and in the majority of cases the tails had become detached from the heads.

The stallion's seminal tract is evidently heavily infected with a corynebacterium (diphtheroid organism).

I have sent samples of serum at the request of the Imperial Bacteriologist to Muktesar, in order to carry out upon it certain agglutination tests.

I am also sending him fresh semen sown on solid culture medium (serum agar), in four tubes, as he is going to endeavour to isolate the organism in pure culture and prepare a vaccine for repeated inoculation.

RUPTURE OF THE UTERUS IN A HEIFER.

By H. R. HEWETSON, M.R.C.V.S.,
Southport.

THE subject, about to calve for the first time, received the aid of the handy man of the village from about nine o'clock until midnight, when he admitted he was unable to deliver the calf. At 3 a.m. the owner sent for me, and on arrival I found her parting with the afterbirth. I traced this into the uterus, which was innocent of any other contents, and it was easily completely removed. I then examined all round the uterus and found, just through and above the os, a small opening through which I could just insert my hand. I immediately recognised that my hand was in the abdominal cavity and therein found the calf floating free amongst the bowels. I then advised the owner to proceed no further and have the animal slaughtered at once, but she could not be convinced that if there was a calf anywhere inside and it was removed that there would be no chance of recovery, etc., etc.! To save further argument I delivered the fœtus through the opening and inserted antiseptic pessaries. Needless to say the heifer died in about five days from septic peritonitis and I made a post-mortem. The rupture had all the appearance of a traumatic wound, as one would expect under the conditions, but the question that naturally arises is, when and how the first rupture took place. The calf at birth was fully developed and did not appear to have been dead long, which together with the expulsion of a normal afterbirth from the uterus would lead one to expect that development had proceeded normally; on the other hand the opening was so small when I first discovered it that my hand only went through with difficulty and was tremendously enlarged in delivering the fœtus through it.

POISONING BY *ŒNANTHE CROCATA*.

By E. C. Winter, F.R.C.V.S.,
Epsom.

Some years ago I was called in by a neighbouring practitioner in the South of Ireland to investigate some mysterious deaths in cattle on an island in the mouth of the Shannon. Four or five cows had died before I was called in, and my colleague could not trace the cause of their death. On investigating the matter I found that the owner had taken over the island, about twenty acres in extent, from the agent of the Earl of Leconfield, who had been grazing it with young stock, and that two herdsmen of his lordship's lived on the island and at that date owned several head of cattle. The deaths always occurred, or were discovered in the mornings after a storm, when the present owner did not sleep on the island as he usually did in fine weather, and only one cow was seen alive by him after being affected. I also discovered that it was only old quiet cows that died. I got the opportunity of making a couple of post-mortems, and found: a frothy discharge from the nostrils, tinged with blood, a somewhat similar discharge from the rectum, mixed with fluid fæces, the lungs slightly congested, as well as the mucous membrane of the reticulum, but no other changes, and the contents of the stomachs and bowels showed nothing abnormal and analysis disclosed no poison present. On washing out the nostrils I discovered the print of a thumb-nail at one side and two finger-nails at the other. There were no poisonous plants on the island, and the water supply, from a pump, proved pure. I came to the conclusion the cows had been maliciously poisoned with some fluid of vegetable origin, and got no further at that time.

Being called in again a few weeks later I had to cross to the island and walk some distance through slob lands which necessitated changing my boots and stockings in the back kitchen of a public house, kept by my client, on the mainland. While doing so in the dusk, unobserved by the other occupants of the room, who were in a maudlin condition, I overheard the following conversation: "I hear they were on the island again to-day." "Begor they were, but Macinthauhoo will beat the whole of them." Now, I soliloquised, if I can find out what "Macinthauhoo" is, I have a key to the riddle. I hurriedly completed my toilet and interviewed an old herd who hung round the yard, asking him if he could get me any "Macinthauhoo."

He promptly stated he would have some for me next time I came down, and asked was it "for the fish" I wanted it? I promptly

said "Yes, and I want it to-night." He then said it was a mile away and demurred at going. However, a nimble half-crown settled the question, and in about an hour he returned with an armful of *Œnanthe crocata*. On my asking him if there was much of it about, he said: "There was, but a power of it had been pulled." In those days an analysis was necessary to get compensation in all poisoning cases, and I sent a portion of the plant, along with the contents of the viscera of one of the dead animals to an analyst, who could not find the alkaloid, but found "a starch in the contents of the stomach identical with the starch in the plant." This is as it may be. I now bought three cheap beasts, incapacitated by accident and disease, and after starving them for twenty-four hours found they would neither eat food mixed with the plant, or drink water mixed with a decoction of it. I then proceeded to drench them with the decoction, and within a few hours they all died with symptoms identical with those seen in the cattle mentioned before death.

I now considered I had proved my case, and on the subsequent trial the grand jury considered so also, and awarded my client full compensation, allowing me to fix the values of the animal, and hinting that it might be on a liberal scale as they could not allow expenses. Lord Leconfield's agent asked me to send the bill to him, and not to be too modest. I received a considerable cheque two days after, and everybody was pleased, except the two herds on the island, who left for America shortly after, fearing criminal proceedings.

The idea was to force my client to give up the island, when they could again enjoy free grazing rights.

IS POST-PARTUM PARALYSIS A FORM OF "MILK FEVER"?

By J. F. D. TUTT, M.R.C.V.S., F.L.S., F.Z.S.,
Winchester.

The number of cases encountered during the past two years of paralysis after calving, unaccompanied by any other symptoms, and which on inflation of the udder with oxygen, have soon recovered, tempt me to ask the question if in some cases what we usually regard as a paralysis may not be a "masked" form of milk fever.

My notice was first drawn to it about eighteen months to two years ago, when I was asked to see a cow unable to get up after calving. She was eating, and chewing the cud, but was quite unable to rise. A blister was applied across the loins, and ℥i doses of Potass. Iodide given every four hours. In twenty-four hours' time, in response to an urgent message, the cow was again seen, and was then showing

symptoms of milk fever. Udder inflation was carried out, and the cow was on her legs within six hours.

A few days later I saw another cow, down after calving, here again consciousness was present, the cow eating and making frenzied efforts to get up. Remembering my other case, I inflated the udder (this was at 11 a.m.) and instructed the owner to send in for a blister to apply across the loins. At 1 p.m., before he had time to use the blister, the cow was up. Since then I have had a remarkable number of cases of post-partum paralysis, unaccompanied by any symptoms of milk fever, and in practically every case the cow has got up within a few hours after inflation of the udder with oxygen, and I now make it a practice whenever I get a cow down and unable to rise, after calving, to do so, and the results have been excellent.

At the time of writing I saw two cows yesterday, both of which had calved a day or two ago, and were unable to get up. In both cases there was no loss of consciousness or appetite, and both got up after inflation of the udder.

In one case that I recollect the cow had been down over a day, and showed no other symptoms beyond inability to get up, and here again inflation of the udder was all that was required.

A SEVERE CASE OF STUTTGART DISEASE, OR CANINE TYPHUS.

By Major H. ALLEN, R.A.V.C.,
Remount Depot, Saharanpur, India, U.P.

Subject.—An eight months' old Cocker spaniel dog.

History.—The dog was sent to me for treatment from another station in the United Provinces.

Nine young and aged dogs had died where it came from during the present year, showing more or less similar symptoms, and the cases had been diagnosed as pneumonia.

Seven dogs died in 1923 at the same place with symptoms of Stuttgart disease.

All cases occurred in the same bungalow.

General Résumé of Symptoms.—Pneumonic gastro-intestinal complications.

The only tangible symptom which I had to work on before the arrival of the dog was unaccountable and repeated vomiting. This symptom whilst under my care only came into evidence a few times before death, when the vomit was of a bloody chocolate colour and decidedly offensive odour. He maintained a good appetite up to time of death. At times he was lively, at other times depressed, and not

caring to move, but remaining in his basket-kennel. Tucked-up appearance, and pain on manipulation of abdomen. Objectionable smell from mouth, defecated with difficulty and passed very offensive blood-stained stools, and blood-stained diarrhœa at times.

Insatiable thirst. Appeared to have difficulty in urinating, and on one occasion signs of hæmaturia. Signs of rapid emaciation. Respirations were rapid and frequent. Weak, thready, rapid pulse. Gums pale, with very faint tinge of yellow. Mucous discharge from nostrils. The temperature was more or less normal early morning, but ran up to 105°–106° at about 9 a.m. There was a swelling of the off hock on arrival, which eventually developed into an abscess and was opened and evacuated. One caries upper canine tooth fell out four days after arrival.

The dog died in convulsions on the fifteenth day at 9 a.m.

Blood-smears examined for piroplasmosis gave negative results. Treatment was essentially symptomatic. The intestinal symptoms were treated with quinine and chlorine mixture.

ASCITES IN A DOG, TREATMENT BY HYPODERMIC INJECTION OF THE ABDOMINAL FLUID.

By B. DORASAMY IYENGAR, G.M.V.C.,
Veterinary Inspector, Hyderabad (Dis.), India.

1. The subject was a puppy, eight months old, and the property of Mr. T. R. Sadasivam, Clerk, Audit Branch, N.G.S. Railways, Secunderabad (Deccan).

2. The animal was suffering from ascites, and was tapped by a fellow practitioner who was my classmate in the Madras Veterinary College.

3. Three days after the operation the patient was brought to me with a note from my friend referred to above. The abdomen was so full of fluid that the poor creature was not able to carry the weight and move about without great discomfort.

4. I examined the animal's heart, which was all right. Knowing that the cause was not the heart and also of the unfavourable prognosis of ascites, I determined to perform paracentesis again and to inject the abdominal fluid hypodermically. I was led to try this sort of treatment from the remembrances I had of an article on "Auto-sero-Theraphy" in one of the American Veterinary Journals of the year 1914.

5. Accordingly, I punctured the abdomen and collected a small quantity of fluid in a sterile glass bowl; immediately injecting 4 c.c. of it hypodermically in two places. I then drained off the remaining fluid as far as practicable, which was nearly 2 pints. There was

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no particular object in giving the injection twice except that my syringe was of 2 c.c. capacity.

6. There was no irritation or pain of any kind afterwards in the sites of injection, but the pup got an asarca of the scrotum and sheath the very next day. This was cleared by hand pressure and the application of tincture of iodine once a day for four days. The pup was watched for four more days. The abdominal cavity did not show any sign of dropsy, and the pup was handed over to the owner hale and healthy on the ninth day after the operation.

REDUCTION OF A COMPLETELY LUXATED EYEBALL IN A DOG.*

By T. D. SIGLENG.

On January 30, 1922, at one o'clock, I was called to see a Griffon Bruxellois, the history given being that in the early morning the owner had found the dog with its eye hanging out. Whether the accident had happened the evening before, or in the early morning, was not quite known.

After examination there seemed to be a total luxation of the eyeball, and behind the eyeball the eyelids were closely contracted; the cornea was dull and sticky, with long hairs adhering to it. The animal was much frightened and difficult to manage, being in very great pain.

In order to make an examination and to be able to treat the animal, a grain of morphia was given.

The eyeball was painted with a 2 per cent. cocaine hydrochlorate solution and bathed with warm sublimate solution (1 : 5,000). There were two small wounds like scratches from a cat's claw on the sclerotic. The corner of the outerside eyelid was incised, and the eyeball was gently massaged and returned into the cavity. After closing the wounds with a fine silk thread, a Priessnitz eye-bandage was put on. For several days this was changed once a day. A fairly strong conjunctivitis developed, and an ulcer formed at the centre of the cornea.

At first the eyeball was treated with 1 per cent. atropine solution and the acute inflammation passed, the ulcer becoming small, and the tension of the surrounding of the eye becoming normal.

For some time the cornea was treated with equal parts of calomel and sugar, as a result of which the ulcer and trouble eventually disappeared; and the eye, after a month, had quite a normal aspect.

* Translated from *Tidschrift Voor diergeneeskunde*.—C. V.

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Abstracts of Current Literature

W. Mansfield-Aders.—Trypanosomiasis of Stock in Zanzibar.—*Transactions of the Journal of Tropical Medicine and Hygiene.*

THE first trypanosome recorded from Zanzibar was discovered by Edington in a horse. His observations were not continued and only dealt with trypanosomiasis in the town of Zanzibar. Since then it has been ascertained that trypanosomiasis is of quite common occurrence throughout the whole island. Trypanosomes of this congolense type have been found in indigenous cattle, horses, mules, donkeys, buffaloes, dogs. The trypanosome is most commonly found in cattle and donkeys, to a lesser degree in other domesticated stock.

The local cattle are of the Zebu type and found in nearly all villages; in certain districts and townships herds of some considerable size are kept. It has been discovered that the most important disease in the Protectorate is East Coast fever; but the natives know of another disease typified by gradual wasting, which has proved to be trypanosomiasis.

The distribution of *Trypanosoma congolense* in the island of Zanzibar is of considerable interest. In the town itself, among stall-fed cattle such as Indian milch cows, no case of trypanosomiasis has been recorded. On the other hand, cattle which are housed at night in the town but work during the day in the out-districts are infected. *T. congolense* is found throughout the whole island to a varying extent, but the disease is more prevalent in those districts where Tabanidæ are found and persist throughout the year. The island of Zanzibar is in certain areas well watered and marshy; here Tabanidæ and other blood-sucking Diptera, such as Chrysops and Hæmatopota are common. Other cattle centres are situated on coral rock where there are no streams or marshes; here the dominant blood-sucking flies are Stomoxys and Lyperosia.

In spite of repeated search no Glossinæ have been captured; an important fact, considering that *Glossina morsitans* is known to be the cyclical vector of *T. congolense*. The geographical distribution of *T. congolense* in the Protectorate is of interest. Where the Tabanid group is prevalent the disease is common; where Stomoxydæ are dominant the malady is not widespread.

Trypanosomiasis in Zanzibar does not cause a great mortality; during the last ten years it has never broken out in epidemic form or assumed disquieting proportions. It has been proved by blood examination that *T. congolense* is to be found in cattle throughout the island. A number of cattle showing a few trypanosomes in their blood have

been under observation for long periods, in some cases for five years, showing no symptoms of ill-health. Further, among batches of cattle brought to the abattoir (for slaughter), a number showed trypanosomes. All such infected animals before slaughter were apparently normal, no signs of emaciation or elevation of temperature being noticeable.

This table shows the incidence of *T. congolense* amongst domesticated stock in Zanzibar :

	Number Examined.	Positive.	Precentage Infected.
Cattle	457	57	12·47
Donkeys	150	12	8·0
Mules	8	0	—
Horses	21	2	9·52
Goats	200	0	—
Camels	30	0	—
Dogs	33	3	9·9
Bombay Cows ..	64	0	—
Buffaloes	18	2	11·1

Trypanosomiasis in Imported Stock.—About 2,000 cattle and 20,000 goats and sheep are imported annually into the Zanzibar Protectorate. The majority come from Kismayu and other Somali ports, a smaller number from Tanganyika Territory. Many of these imported animals have shown trypanosomes of various species in their blood.

The following have been identified :

T. congolense.—In cattle, horses, donkeys, sheep, goats and camels.

T. vivax.—In cattle.

T. brucei.—In cattle.

T. evansi.—In camels.

So far as we have discovered the above-mentioned species, with the exception of *T. congolense*, have not become established in the island.

All imported animals are quarantined and blood films examined ; any showing trypanosomes are killed in the quarantine park.

Imported animals from Tanganyika Territory show a high rate of infection with *T. congolense* and *T. vivax* ; only one ox was found harbouring *T. brucei*. *T. congolense* was detected in cattle, goats and sheep.

On the other hand, cattle imported from Kismayu and northern Somali ports show a very low rate of infection with *T. congolense* and *T. vivax*. In a few camels from Somali ports a trypanosome of the *evansi* type has been seen.

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It is of some interest that though a large number of Socotran and Southern Arabian cows were examined (350 in all), none of them showed trypanosomes.

This phenomenon can perhaps be explained by the prevalence of Glossinæ in Tanganyika Territory and their comparative rarity in northerly ports.

One hundred animals examined at random in Mkokotoni showed an infective rate of 18 per cent., in Mwera 16 per cent.

At Chuaka and Makunduchi in open rocky dry country, few Tabanids but many Stomoxydæ and Lyperosia were found. Out of one hundred animals Chuaka showed an infection of 6 per cent. and Makunduchi only 2 per cent. Further, numbers of stall-fed cattle are kept in Zanzibar town, and they are never taken out to graze, owing to the surrounding pasturages being infected with East Coast fever. No trypanosomes have been found in these animals, although Stomoxydæ abound, and infected animals (indigenous cattle) are outspanned in close proximity to the town cow-byres.

Conclusion.

1. That *T. congolense* is found throughout Zanzibar island with the exception of stall-fed cattle in the town.

2. That the strain is not very virulent to cattle, as many have been found with trypanosomes in their blood apparently in good health. Some have been under observation for years and are still alive. That no epidemic attributable to *T. congolense* has been recorded.

3. This latter fact could perhaps be accounted for by the absence of cyclical development, as no Glossinæ have been found. Our strain may have become attenuated by continuous direct transmission.

4. That Tabanidæ are the chief vectors, Stomoxys and Lyperosia to a far lesser degree.

5. That numbers of cattle kept stall-fed in the town, where Stomoxydæ are ubiquitous, have not become infected.

6. That local goats do not harbour trypanosomes; this might be accounted for by their long hair, general restlessness, and odour. Tabanidæ have never been caught or observed feeding on goats.

7. Biological data show that cattle, donkeys, goats, sheep, monkeys, lemurs and giant rats are susceptible. Guinea-pigs are refractory. That passage through goats, sheep and giant rats reduces virulence for other animals, but they themselves remain susceptible.

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Review

Des Arsénobenzènes et des Néoarsénobenzènes dans les Affections des Animaux Domestiques. By Professor Dr. MAURICE DOUVILLE. Lyon, 1923. Pp. 206.

This is a thesis submitted for the Doctorate in Medicine of the University of Lyons. Dr. Douville, a graduate of Alfort, and Professor of Clinical Medicine at the National Veterinary School of Lyons, is to be congratulated on his new honour, following as it does on the production of a piece of work in the domain of comparative therapeutics which deserves every praise. His conclusions are that the arsenobenzes (type 606) and the neoarsenobenzenes (type 914, Rhodarsan, etc.) are, among the organic arsenical compounds, those whose antiparasitic action is the most evident, and which can be utilised with the maximum of therapeutic activity and security in domesticated animals.

Their intimate mode of action is explained by phenomena of intratissular oxidation which transforms them into bodies toxic for parasites, and besides their parasiticidal power, their intravenous administration involves important modifications in the organism : a real blood renewal and an appreciable hyperleucocytosis, both of which are salutory for the defence of the organism.

The neoarsenobenzene is more easily handled, less toxic, and easier of employment than arsenobenzene. It gives remarkable results in trypanosomiasis of solipeds and bovines, in avian spirillosis, in cryptococcic lymphangitis of equines, in typhoid diseases and in contagious pleuropneumonia of solipeds, in autotoxic dermatosis and in certain gangrenous buccal ulcerations in the dog. F. B.

Obituary

By the deaths of Drs. Septimus Sisson and Fred Torrance, the American Veterinary Medical Association has lost two prominent members, and the veterinary profession on the other side of the water has lost two of its most important workers.

Dr. Septimus Sisson was well known to us in England from his splendid book on *Anatomy*, which had become one of the recognised text-books of all English-speaking colleges. English by birth, he first saw daylight at Gateshead-on-Tyne in 1865, and emigrated from England when he was seventeen years old. Graduating from the Ontario Veterinary College in 1891, he took a further B.Sc. degree some seven years later in the University of Chicago, whilst the University of his *alma mater* conferred upon him an Honorary D.V.Sc. some three years ago. It will be remembered by those of the National Veterinary Medical Association who met him at the Annual Conference in 1923 at York with what delight he learnt that it had been decided to confer upon him the Honorary Membership, and his modesty of manner, not only when accepting this, but at all times when discussing questions on which he was the master mind with his English colleagues will be remembered by all who had the pleasure of making his acquaintance.

Dr. Fred Torrance was a Canadian, and was born in 1859, graduating as B.A. and D.V.S. from McGill University. For some years he prac-

tised in the Province of Manitoba, being so well thought of by his colleagues as to be elected the President of their Veterinary Association. He was Professor of Veterinary Science in the Manitoba Agricultural College, and the American Veterinary Medical Association elected him their President in 1917. On the death of Dr. J. G. Rutherford in 1912, Dr. Fred Torrance was selected by the Governments the Veterinary Director-General of Canada, and he held this position until last year. During his period of office a great deal of effective work was done in the eradication and control of contagious disease amongst animals, and one can look back with pride, particularly during this time, to the work done by the members of the veterinary profession under his control on such devastating diseases as glanders, tuberculosis, dourine, and hog cholera. Even on his retirement his enthusiasm would not permit him to keep away from veterinary work, and he took up the post of Professor of Physiology and Hygiene in the Ontario Veterinary College. To us in England his name was well known, and it will be remembered that after the War he was one of a few who were selected for, and accepted, the Honorary Fellowship of the Central Veterinary Society of London.

Therapeutical Preparations

Waite's Local Anæsthetic.—Some months ago samples were received for trial of Waite's Local Anæsthetic, a preparation already well known to the dental profession and recently brought prominently to the notice of the veterinary profession by Dr. L. A. Merrillatt, of Chicago. It is prepared by the Antidolar Manufacturing Co. of Springville, Erie Co., New York, U.S.A., and their agents in this country are the Dental Manufacturing Co., Newman Street, London, W.1. Two formulæ are given as entering into its composition, as it is stated to be an aqueous sterile solution of 2 per cent. Procaine, Phenol, Ortho and Para-Mono-Iodo-Phenol and Glycerinum ; or 1 per cent. Cocaine Phenol, Ortho and Para-Mono-Iodo-Phenol and Glycerine ; and it is put up in hermetically sealed glass tubes varying in size from 1½ cc. to 3 cc. Procaine is a synthetic preparation built up on similar lines to Novocain. The advantages claimed for it are that it is sterile and thus gives no danger of septic infection or sloughing ; no after-soreness of the tissues ; a perfect anæsthesia and freedom from toxic reaction if used in the dosage given in the instructions.

So far as the reports have been received from those who have tried it at our suggestion, and so far as our own experience is concerned, Waite's Local Anæsthetic has fulfilled everything claimed for it, both in regard to the blocking of the nerves in horse practice for the diagnosis of lameness and for painful operations, and in the dog for all kinds of tumour removals.

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